Attachment G

Roanoke River TMDLs

- **Benthic TMDL Development for the Roanoke River, March 2006 (Excerpt)**
- **Bacteria TMDLs for Wilson Creek, Ore Branch, and Roanoke River Watersheds, Virginia, February 2006 (Excerpt)**

Benthic TMDL Development for the Roanoke River, Virginia

Submitted to

Virginia Department of Environmental Quality

Prepared by

THE Louis Berger Group, INC.
2300 N Street, NW
Washington, DC 20037

March 2006

(Upper Roanoke River Watershed)
EPA approved 5/10/06
SWCB approved 9/7/06

7.1.2 Wasteload Allocation

The wasteload allocated to point sources in the watershed was based on the permitted discharge loading rate for total suspended solids for each facility as shown in Table 7-1. Because the facilities typically contribute only non-settleable solids, and their overall contribution to the total annual watershed sediment load is small, no reductions are required for these sources.

The Cities of Roanoke and Salem, as well as portions of Roanoke, Botetourt, and Montgomery Counties, and three facilities located within the Roanoke City metropolitan area, are covered by MS4 permits which are included in the wasteload allocations. As discussed in Section 6.0, land-based loads were allocated to the MS4 based on an area weighted method. The MS4 wasteload allocations by land use type for all the permitees are presented in Table 7-2. Table 7-3 shows the individual sediment allocation for each MS4 urban area. As indicated in Table 7-2, a 69.5 percent reduction in urban, agricultural, and transitional land-based sources and instream erosion allocated to the MS4s is required to achieve the TMDL endpoint. Wasteload allocations were based on an equal percent reduction from controllable sources. Loads from forested lands are considered to be representative of the natural condition and therefore were not subject to reductions.

Wasteload allocations for facilities in the watershed holding general stormwater permits are presented in Appendix D. The majority of the facilities holding general stormwater permits is located in areas covered by MS4 permits, and is thus included in the MS4 wasteload allocation.

Appendix D provides a finer breakdown of the wasteload allocation by providing specific wasteload allocations for each facility holding a general stormwater permit.

Table E-3: Point Sources Sediment TMDL Allocations

Facility Name	Permit Number	Annual Sediment Loads (tons/yr)	Allocated Loads (tons/yr)	Percent Reduction
Western Virginia Water Authority	VA0025020	472.2	472.2	0
Roanoke Electric Steel Corporation	VA0001589	92.9	92.9	0
Shawville Town STP	VA0024031	9.1	9.1	0
Carvin Cove Water Filtration Plant	VA0001473	17.6	17.6	0
Crystal Springs WTP	VA0091065	8.8	8.8	0
Norfolk Southern Railway Company - Shaffers Crossings	VA0001597	1.62	1.62	0
Ellison Lafayette WWTP	VA0062219	11.2	11.2	0
Blacksburg Country Club STP	VA0027481	1.57	1.57	0
Roanoke Moose Lodge	VA0077895	0.21	0.21	0
		Total Allocated Load	**615.3**	**0**

The MS4 allocations detailed in Table E-2 are broken down by MS4 Urban area and shown in Table E-4.

Table E-4: Sediment TMDL Wasteload Allocations for MS4 Urban Areas

MS4 Permit Holder	Permit Number	Sediment Allocation (Tons/Year)
Roanoke County	VAR040022	1823
City of Roanoke	VAR040004	1487
Town of Vinton	VAR040026	128
Botetourt County	VAR040023	327
City of Salem	VAR040010	589
VDOT Roanoke Urban Area	VAR040017	27
Virginia Western Community College	VAR040030	2
Virginia Medical Center	VAR040050	10
VDOT Montgomery County Urban Area	VAR040016	4
Town of Blacksburg	VAR040019	102
Town of Christianburg	VAR040025	75
	Total	**4573**

The MS4 sediment loads shown in Table E-4 include the loads from individual MS4s permits for urban areas as well as loads from Individual Stormwater Permits, General Stormwater Permits, General Permits for Mines, General Permits for Concrete Facilities, General Permits for Carwashes, and General Permits for Construction Sites. Table E-5 depicts the breakdown of loads other than the individual MS4-permits loads for each urban area. Table E-6 shows the wasteload allocation for each specific MS4 permit.

Table E-5: Wasteload Allocation for Stormwater Permits by MS4 Urban Area* (tons/year)

MS4 Urban Area	Individual Permits	General Permits	Mines	Concrete Facilities	Carwashes	Construction Sites	Totals
Roanoke County	-	19.65	-	-	-	123.95	143.60
City of Roanoke	108.1	316.8	7	0.9	0.1	101.11	534.01
Town of Vinton	-	-	-	-	-	8.70	8.70
Botetourt County	-	0.62	15.6	2.43	-	22.23	40.88
City of Salem	18.4	101.6		0.2		40.05	160.25
VDOT Roanoke Urban Area	-	-	-	-	-	1.84	1.84
Virginia Western Community College	-	-	-	-	-	0.14	0.14
Virginia Medical Center	-	-	-	-	-	0.68	0.68
VDOT Montgomery County Urban Area	-	-	-	-	-	0.27	0.27
Town of Blacksburg	12.3	-	-	-	-	6.94	19.24
Town of Christianburg	-	-	-	-	-	5.10	5.10
Total	**138.8**	**438.67**	**22.6**	**3.53**	**0.1**	**311**	**914.7**

* Does not include the load for the specific MS4 urban area permit – Shown in Table E-6 below. The breakdown by individual permit is shown in Appendix D

Based on the number of disturbed land-acres specified in the stormwater construction permits issued between 2002 and 2004, it is estimated that on the average approximately

467 acres are annually under construction. The total allocated load was calculated based on a per acre loading unit of 10.97 metric tons of sediment per hectare, the disturbed construction area of 476 acres, and a sediment delivery ratio of 0.136. This corresponds to an average total sediment allocation of 311 tons/year (Appendix D, Table D-7).

Table E-6: Wasteload Allocation for each Individual MS4 Permit

MS4 Permit Holder	Permit Number	Sediment Allocation (Tons/Year)
Roanoke County	VAR040022	1680.0
City of Roanoke	VAR040004	953.0
Town of Vinton	VAR040026	119.30
Botetourt County	VAR040023	286.1
City of Salem	VAR040010	428.8
VDOT Roanoke Urban Area	VAR040017	25.2
Virginia Western Community College	VAR040030	1.9
Virginia Medical Center	VAR040050	9.3
VDOT Montgomery County Urban Area	VAR040016	3.7
Town of Blacksburg	VAR040019	82.8
Town of Christianburg	VAR040025	69.90
	Total	**3659.3**

Implementation

In general, Virginia intends for the required reductions to be implemented in an iterative process that first addresses those sources with the largest impact on water quality. Among the most efficient sediment BMPs for both urban and rural watersheds are infiltration and retention basins, riparian buffer zones, grassed waterways, streambank protection and stabilization, and wetland development or enhancement.

Once developed, DEQ intends to incorporate the TMDL implementation plan into the appropriate Water Quality Management Plan (WQMP), in accordance with the Clean Water Act's Section 303(e). In response to a Memorandum of Understanding (MOU) between EPA and DEQ, DEQ also submitted a draft Continuous Planning Process to EPA in which DEQ commits to regularly updating the WQMPs. Thus, the WQMPs will be, among other things, the repository for all TMDLs and TMDL implementation plans developed within a river basin.

APPENDIX D: General Permit & Individual Permit Stormwater TMDL Allocations

The TSS allocation for each permitted facility was calculated using a DEQ assigned TSS concentration and the corresponding runoff amount generated on the site based on the facility area or the facility discharge. The TSS allocated load for each permit type was calculated as follows:

- For individual permitted facilities, the allocated load was calculated based on a TSS concentration of 100 mg/L, the facility area, and 72.54 cm of runoff per year. The annual average runoff of 72.54 cm corresponds to an annual average rainfall of 40.8 inches (103.63 cm) and an industrial land cover with 70 percent imperviousness.
- For general stormwater permits issued to industrial facilities, the allocated load was calculated based on a TSS concentration of 100 mg/L, the facility area, and 72.54 cm of runoff per year.
- For general permits issued to domestic sewage facilities, the allocated load was calculated based on a TSS concentration of 30 mg/L and a flow value of 1,000 gallons per day.
- For general permits issued to mines, the allocated load was calculated based on a TSS concentration of 30 mg/L, the facility area, and 45.9 cm of runoff per year.
- For general permits issued to concrete facilities, the allocated load was calculated based on a TSS concentration of 30 mg/L, the facility area, and 72.54 cm of runoff per year.
- For general stormwater permits issued to carwashes, the allocated load was calculated based on a TSS concentration of 60 mg/L, the facility area, and 72.54 cm of runoff per year.
- For general stormwater permits issued to construction sites, the total allocated load was calculated based on a per acre loading unit of 10.97 metric tons of sediment per hectare, the disturbed construction area, and a sediment delivery ratio of 0.136. Table D-7 depicts the combined sediment load from all construction sites based on an average annual disturbed area of 467 acres. The average annual acreage of 467 acres was derived using information from the VADEQ Comprehensive Environmental Database System (CEDS) database for the period of 2002 to 2004.

Table D-1: Stormwater TMDL Allocations for Individual Permitted Facilities

Permit Number	Facility	TSS Stormwater Allocation (tons/yr)
VA0001252	Associated Asphalt Inc.	2.78
VA0001333	Koppers Inc.	18.24
VA0001589	Roanoke Electric Steel Corp.	56.55
VA0001511	Norfolk Southern Railway Co - East End Shops	35.70
VA0001597	Norfolk Southern Railway Co. - Shaffers Crossing	28.83
VA0025020	Western Virginia Water Authority	34.17
VA0088358	Fred Whitaker Co.	0.97
VA0089991	Federal Mogul Corp.	12.30

Table D-2: TMDL Allocations for General Stormwater Permits Issued to Industrial Facilities

Permit Number	Facility	Receiving Waterbody	MS4 Area	TSS Allocation (tons/yr)
VAR050027	Auto Salvage & Sales, Inc.	Tinker Creek	Roanoke City	0.53
VAR050134	Greater Roanoke Transit Company	Lick Run	Roanoke City	0.81
VAR050135	Virginia Scrap Iron & Metal Company Inc	Roanoke River	Roanoke City	1.66
VAR050143	Virginia Scrap Iron & Metal Incorporated	Roanoke River	Roanoke City	1.66
VAR050144	North 11 Asphalt Plant - Roanoke	Carvins Creek	Roanoke City	27.43
VAR050145	Holland-Richards Vault Service	Mason Creek	Roanoke City	0.25
VAR050178	BFI Waste Systems LLC - Roanoke	Roanoke River	Roanoke City	0.63
VAR050207	1915 Plantation Rd LLC	Lick Run	Roanoke City	0.63
VAR050208	Walker Machine & Foundry Corp	Roanoke River	Roanoke City	2.40
VAR050272	Roanoke Regional Airport	Deer Creek	Roanoke City	179.22
VAR050273	Ralph Smith Inc Steel Fabrication	Roanoke River UT	Roanoke City	0.67
VAR050274	USPS Roanoke Vehicle Maintenance Service	Roanoke River	Roanoke City	3.56
VAR050275	Old Dominion Auto Salvage	Tinker Creek	Roanoke City	3.46
VAR050436	Norfolk Southern Corp - Roadway Material Yard	Roanoke River	Roanoke City	0.49
VAR050437	Estes Express Lines Incorporated	Roanoke River, UT	Roanoke City	2.33
VAR050460	Yellow Freight System Inc	Tinker Creek	Roanoke City	1.62
VAR050496	Federal Express Corp - ROAA Station	Lick Run	Roanoke City	1.69
VAR050516	Mennel Milling Company	Roanoke River	Roanoke City	0.32
VAR050519	FedEx Freight East, Inc.	UT to Lick Run	Roanoke City	1.73
VAR050520	O'Neal Steel Inc	Tinker Creek	Roanoke City	6.46
VAR050522	Progress Rail Services Corp - Roanoke	Roanoke River	Roanoke City	3.95

Table D-1: Stormwater TMDL Allocations for Individual Permitted Facilities

Permit Number	Facility	TSS Stormwater Allocation (tons/yr)
VA0001252	Associated Asphalt Inc.	2.78
VA0001333	Koppers Inc.	18.24
VA0001589	Roanoke Electric Steel Corp.	56.55
VA0001511	Norfolk Southern Railway Co - East End Shops	35.70
VA0001597	Norfolk Southern Railway Co. - Shaffers Crossing	28.83
VA0025020	Western Virginia Water Authority	34.17
VA0088358	Fred Whitaker Co.	0.97
VA0089991	Federal Mogul Corp.	12.30

Table D-2: TMDL Allocations for General Stormwater Permits Issued to Industrial Facilities

Permit Number	Facility	Receiving Waterbody	MS4 Area	TSS Allocation (tons/yr)
VAR050027	Auto Salvage & Sales, Inc.	Tinker Creek	Roanoke City	0.53
VAR050134	Greater Roanoke Transit Company	Lick Run	Roanoke City	0.81
VAR050135	Virginia Scrap Iron & Metal Company Inc	Roanoke River	Roanoke City	1.66
VAR050143	Virginia Scrap Iron & Metal Incorporated	Roanoke River	Roanoke City	1.66
VAR050144	North 11 Asphalt Plant - Roanoke	Carvins Creek	Roanoke City	27.43
VAR050145	Holland-Richards Vault Service	Mason Creek	Roanoke City	0.25
VAR050178	BFI Waste Systems LLC - Roanoke	Roanoke River	Roanoke City	0.63
VAR050207	1915 Plantation Rd LLC	Lick Run	Roanoke City	0.63
VAR050208	Walker Machine & Foundry Corp	Roanoke River	Roanoke City	2.40
VAR050272	Roanoke Regional Airport	Deer Creek	Roanoke City	179.22
VAR050273	Ralph Smith Inc Steel Fabrication	Roanoke River UT	Roanoke City	0.67
VAR050274	USPS Roanoke Vehicle Maintenance Service	Roanoke River	Roanoke City	3.56
VAR050275	Old Dominion Auto Salvage	Tinker Creek	Roanoke City	3.46
VAR050436	Norfolk Southern Corp - Roadway Material Yard	Roanoke River	Roanoke City	0.49
VAR050437	Estes Express Lines Incorporated	Roanoke River, UT	Roanoke City	2.33
VAR050460	Yellow Freight System Inc	Tinker Creek	Roanoke City	1.62
VAR050496	Federal Express Corp - ROAA Station	Lick Run	Roanoke City	1.69
VAR050516	Mennel Milling Company	Roanoke River	Roanoke City	0.32
VAR050519	FedEx Freight East, Inc.	UT to Lick Run	Roanoke City	1.73
VAR050520	O'Neal Steel Inc	Tinker Creek	Roanoke City	6.46
VAR050522	Progress Rail Services Corp - Roanoke	Roanoke River	Roanoke City	3.95

Permit Number	Facility	Receiving Waterbody	MS4 Area	TSS Allocation (tons/yr)
VAR050530	Shenandoah Auto Parts	Lick Run	Roanoke City	0.60
VAR050539	Kenan Transport Co	Tinker Creek, UT	Roanoke City	1.62
VAR050643	Akzo Nobel Coatings Inc	Roanoke River	Roanoke City	1.13
VAR050717	Cycle Systems Incorporated	Ore Branch	Roanoke City	1.77
VAR050743	Hanson Concrete Products Inc - Roanoke	Roanoke River	Roanoke City	0.77
VAR050757	Metalsa Roanoke Inc	Tinker Creek	Roanoke City	12.96
VAR050843	Estes Express Lines Inc - Roanoke	Tinker Creek	Roanoke City	0.99
VAR051315	A D Weddle Company Inc	Tinker Creek	Roanoke City	2.36
VAR051371	Roanoke Regional Water Pollution Control Plant	Roanoke River	Roanoke City	34.20
VAR051460	Dynax American Corporation	Cook Creek	Roanoke City	5.15
VAR051478	Precision Steel	Glade Creek UT	Roanoke City	1.69
VAR051480	J and J Asphalt Incorporated	UT, Roanoke River	Roanoke City	0.18
VAR051492	Virginia Transformer Corp	Glade Creek, UT	Roanoke City	2.89
VAR520005	Vishay Vitramon Inc	Tinker Creek	Roanoke City	7.10
VAR520131	Virginia DMA - OMS #10	Roanoke River	Roanoke City	0.92
VAR520200	Hancock Rack Systems	Roanoke River	Roanoke City	0.85
VAR051199	Pitt Ohio Express Roanoke Terminal - Plantation Rd	Tinker Creek	Roanoke City	0.92
VAR051262	Shorewood Packaging Corporation	Tinker Creek	Roanoke City	0.85
VAR050146	Hedge Metal Company Incorporated	Roanoke River	Salem City	0.11
VAR050148	Salem Frame Company	Mill Race to Roanoke River	Salem City	11.44
VAR050150	Graham White Manufacturing Company	Snyders Branch	Salem City	7.28
VAR050174	Carbone of America Corporation	Masons Creek	Salem City	2.54
VAR050175	General Electric Industrial Systems	Masons Creek	Salem City	24.40
VAR050176	John W Hancock Jr Incorporated	Roanoke River	Salem City	0.85
VAR050457	Waste Management of Virginia - Salem	Roanoke River, UT	Salem City	1.98
VAR050506	Timber Truss Housing Systems Inc	Roanoke River, UT	Salem City	19.13
VAR050515	Yokohama Tire Corp	Roanoke River, UT	Salem City	18.00
VAR050744	Hanson Concrete Products Inc Salem1	Roanoke River	Salem City	1.73
VAR050745	Hanson Concrete Products Inc Salem2	Roanoke River	Salem City	4.41
VAR050749	Valleydale Foods Incorporated	Roanoke River	Salem City	3.18

Table E-3: Point Sources Sediment TMDL Allocations

Facility Name	Permit Number	Annual Sediment Loads (tons/yr)	Allocated Loads (tons/yr)	Percent Reduction
Western Virginia Water Authority	VA0025020	472.2	472.2	0
Roanoke Electric Steel Corporation	VA0001589	92.9	92.9	0
Shawville Town STP	VA0024031	9.1	9.1	0
Carvin Cove Water Filtration Plant	VA0001473	17.6	17.6	0
Crystal Springs WTP	VA0091065	8.8	8.8	0
Norfolk Southern Railway Company - Shaffers Crossings	VA0001597	1.62	1.62	0
Ellison Lafayette WWTP	VA0062219	11.2	11.2	0
Blacksburg Country Club STP	VA0027481	1.57	1.57	0
Roanoke Moose Lodge	VA0077895	0.21	0.21	0
		Total Allocated Load	**615.3**	**0**

The MS4 allocations detailed in Table E-2 are broken down by MS4 Urban area and shown in Table E-4.

Table E-4: Sediment TMDL Wasteload Allocations for MS4 Urban Areas

MS4 Permit Holder	Permit Number	Sediment Allocation (Tons/Year)
Roanoke County	VAR040022	1823
City of Roanoke	VAR040004	1487
Town of Vinton	VAR040026	128
Botetourt County	VAR040023	327
City of Salem	VAR040010	589
VDOT Roanoke Urban Area	VAR040017	27
Virginia Western Community College	VAR040030	2
Virginia Medical Center	VAR040050	10
VDOT Montgomery County Urban Area	VAR040016	4
Town of Blacksburg	VAR040019	102
Town of Christianburg	VAR040025	75
	Total	**4573**

MEMORANDUM
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
West Central Regional Office

3019 Peters Creek Rd. Roanoke, VA 24019

SUBJECT: Waste Load Allocation Scenarios for the Roanoke River TMDL Study

TO: Becky France, Kip Foster

FROM: Jason Hill, Greg Anderson

DATE: April 28, 2005

COPIES: Jutta Schneider, Steve Dietrich , Marcia Degen, Mike McLeod, William Bishop, Mary Dail

This memo specifically evaluates permit modification scenarios for the Western Virginia Water Authorities (WVWA) regional wastewater treatment facility. The 'most probable stressor' to the biological community in the Roanoke River watershed has been identified as sedimentation.

Although the sediment study has not been approved by EPA, the model outputs that *will be used* in establishing the Total Maximum Daily Load (TMDL) are used in this memo. The primary goal of this memo is to evaluate how much of the average annual sediment load is from currently point sources (Waste Load Allocation – 'WLA') versus non-point sources (Load Allocation – 'LA') and how will the permit modification at the regional wastewater treatment facility alter that load.

Existing Sediment Load (WLA versus LA)

Western Virginia Water Authority Permitted Load for Average TSS = 2.5 mg/L @ 42 MGD = 160 Tons/Year

Other Permitted Facilities (Non MS4 & Construction Stormwater) = 100 Tons/Year

Annual LA (Non-Point Source) Load = 57,650 Tons/Year

Recommended LA target to improve biological condition = 18,530 Tons/Year

At current permitted limits, the WVWA facility is 0.28% of the total sediment load.
At current permitted limits, the WVWA facility is 0.86% of the recommended Non Point Source load.

Future Sediment Load Scenarios (WLA versus LA)

Scenario 1: Average TSS = 3 mg/L @ 55 MGD = 251 Tons/Year
WVWA facility is 1.35% of the recommended Non Point Source load.

Scenario 2: Average TSS = 5 mg/L @ 55 MGD = 418 Tons/Year
WVWA facility is 2.26% of the recommended Non Point Source load.

Scenario 3: Average TSS = 5 mg/L @ 62 MGD = 472 Tons/Year
WVWA facility is 2.55% of the recommended Non Point Source load.

Scenario 4: Average TSS = 7 mg/L @ 55 MGD = 586 Tons/Year
WVWA facility is 3.16% of the recommended Non Point Source load.

Scenario 5: Average TSS = 10 mg/L @ 55 MGD = 838 Tons/Year
WVWA facility is 4.35% of the recommended Non Point Source load.

Scenario 6: Average TSS = 3 mg/L @ 105 MGD = 480 Tons/Year
WVWA facility is 2.59% of the recommended Non Point Source load.

Scenario 7: Average TSS = 5 mg/L @ 105 MGD = 800 Tons/Year
WVWA facility is 4.32% of the recommended Non Point Source load.

Scenario 8: Average TSS = 7 mg/L @ 105 MGD = 1119 Tons/Year
WVWA facility is 6.04% of the recommended Non Point Source load.

Scenario 9: Average TSS = 10 mg/L @ 105 MGD = 1599 Tons/Year
WVWA facility is 8.63% of the recommended Non Point Source load.

Stormwater Construction permits and MS4 permits will be calculated as a part of the WLA and will are likely to comprise a significant sediment load in the TMDL (perhaps 20% of the total load). These MS4 loads will be taken out of the reported loads in Tables 1. However, these sources will not be receiving an increase in their WLA, but in most sediment TMDL studies a 50%-65% target reduction will be included in the final report. These issues are important to consider as you review the different scenarios.

Table 1. Draft GWLF Model Outputs April 2005.

	Impaired Watershed	Reference Watershed (Adjusted)
Source	**Sed (tons/yr)**	**Sed (tons/yr)**
Open water	0	0
Quarries/Strip Mines/Gravel Pits	767	408
Transitional	842	780
Deciduous Forest	867	973
Evergreen Forest	87	100
Mixed Forest	187	197
Pasture/Hay	2004	2088
Row Crop	3285	5260
Urban/Recreational Grasses	36	2
Woody Wetlands	0	0
Emergent Herbaceous	0	0
Low intensity residential	139	27
High Intensity Residential	74	3
Commercial/Industrial	4240	1642
Point Sources	275	22
Instream Erosion	44846	9490
Total	57649	20993

Table 2. Draft TMDL Equation (this will change in the final report).

TMDL Equation:	
LA	**18532**
WLA	**275**
MOS	**2099**
TMDL	**20906**

Bacteria TMDLs for Wilson Creek, Ore Branch and Roanoke River Watersheds, Virginia

Submitted by

Virginia Department of Environmental Quality

Prepared by

and

THE Louis Berger Group, INC.
2300 N Street, NW
Washington, DC 20037

February 2006

EPA approved 8/2/06
SWCB approved 6/27/07

Executive Summary

This report presents the development of Bacteria TMDLs for the Wilson Creek, Ore Branch and Roanoke River watersheds, located in the Upper Roanoke River Basin. Segments of Wilson Creek, Ore Branch and the Roanoke River were listed as impaired on Virginia's 1998 303(d) Total Maximum Daily Load Priority List and Report (DEQ, 1998) because of violations of the state's water quality standard for fecal coliform bacteria. These segments were also included on Virginia's 2002 303(d) Report on Impaired Waters and 2004 305(b)/303(d) Water Quality Assessment Integrated Report. The impaired segments are located in the Upper Roanoke River Basin in southwestern Virginia.

Description of the Study Area

Wilson Creek is a tributary to the North Fork Roanoke River and is located in Montgomery County, while Ore Branch is a tributary to the Roanoke River and flows from Roanoke County into Roanoke City. The impaired segment of the Roanoke River begins in Salem City and flows through Roanoke City into Roanoke County. All three streams are located in the Upper Roanoke River Basin (USGS Cataloging Unit 03010101). The watershed is approximately 371,658 acres (580 square miles) and drains portions of Floyd, Montgomery, Roanoke, Botetourt, Bedford and Franklin Counties and all of Salem and Roanoke Cities.

Bacteria TMDLs have already been approved for five impaired streams in the watershed: Carvin Creek, Glade Creek, Laymantown Creek, Lick Run and Tinker Creek. The first four impairments all flow into Tinker Creek, which then flows into the Roanoke River just upstream of the Roanoke City/Roanoke County line near Vinton, Virginia. The results of the bacteria TMDLs developed for the Tinker Creek watershed were input into the model developed for this study.

Approximately 40 percent of the drainage basin is located in Roanoke County, 32 percent in Montgomery County and 12 percent in Botetourt County; the remainder of the watershed is divided among Floyd, Franklin and Bedford Counties (six, two and one

percent, respectively) and the Cities of Roanoke and Salem (six and two percent, respectively). The watershed makes up 100 percent of the land area in the Cities of Roanoke and Salem, 90 percent of Roanoke County, 48 percent of Montgomery County, 13 percent of Botetourt County, eight percent of Floyd County and one percent each of Bedford and Franklin Counties. Interstate Route 81 (I-81) and U.S. Route 11 (US-11) run the entire length of the watershed from the northeast near Troutville to the southwest near Christiansburg. U.S. Route 221 (US-221) and the Blue Ridge Parkway pass through the lower section of the watershed in a northeast to southwest direction. U.S. Route 220 (US-220) runs the lower half of the watershed from the north near Trinity to the south near Boones Mill.

Impairment Description

The impaired segment of Wilson Creek (VAW-L02R-02) begins just east of Route 460, off Route 723 near Christiansburg and ends at the mouth of Wilson Creek on the North Fork of the Roanoke River just upstream of Route 603. The segment includes an unnamed tributary 1.65 mi. long that flows into Wilson Creek from the north. Fourteen of 27 samples (52%) collected at the listing station (4AWLN000.40) between January 1, 1998 and December 31, 2002 exceeded the fecal coliform bacteria instantaneous criterion of 400 cfu/100 ml, while two of three samples (67%) collected during the same period exceeded the *Escherichia coli* (*E. coli*) instantaneous criterion of 235 cfu/100 ml.

The entire length of Ore Branch is impaired (VAW-L04R-04), from the headwaters to the mouth of Ore Branch on the Roanoke River. Three of six samples (50%) collected at the listing station (4AORE000.19) between January 1, 1998 and December 31, 2002 exceeded the fecal coliform bacteria instantaneous criterion of 400 cfu/100 ml. In addition to the impaired segments on Wilson Creek and Ore Branch, this report also addresses two impairments on the Roanoke River. The first impaired segment (VAW-L04R-01) begins at the confluence of Mason Creek with the Roanoke River at river mile 210.47 and ends at the outfall of the Roanoke Regional STP at river mile 200.60. This impairment is based on two listing stations: 4AROA212.17 and 4AROA202.20. Eight of 41 samples (20%) collected at 4AROA212.17 and 17 of 58 samples (29%) collected at

4AROA202.20 between January 1, 1998 and December 31, 2002 exceeded the fecal coliform bacteria instantaneous criterion of 400 cfu/100 ml. The second impaired segment (VAW-L04R-02) begins at the Roanoke Regional STP outfall and ends at the Niagara Dam at river mile 198.36. The total length of these four segments is 23.09 miles.

Applicable Water Quality Standards

At the time of the Wilson Creek, Ore Branch and Roanoke River listings, the Virginia Bacteria Water Quality Standard was expressed in fecal coliform bacteria; however, the bacteria water quality standard has been recently changed and is now expressed in E. coli. Virginia's bacteria water quality standard currently states that E. coli bacteria shall not exceed a geometric mean of 126 E. coli counts per 100 ml of water for two or more samples over a 30-day period or an E. coli concentration of 235 counts per 100 ml of water at anytime. However, the loading rates for watershed-based modeling are available only in terms of the previous standard, fecal coliform bacteria. Therefore, the TMDL was expressed in E. coli by converting modeled daily fecal coliform concentrations to daily E. coli concentrations using an in-stream translator. This TMDL was required to meet both the geometric mean and instantaneous E. coli water quality standard.

Watershed Characterization

Land use characterization was based on National Land Cover Data (NLCD) developed by USGS. The watershed is predominantly forested, with some agricultural lands clustered in the northeastern portion of the watershed. Urban and residential areas are clustered around the Cities of Roanoke and Salem in the eastern half of the watershed, with some smaller clusters located on the western edge of the watershed near Christianburg. Forested and agricultural lands consist of 73.2 and 15.4 percent respectively of the total drainage area Urban lands consists of 10 percent of total drainage area.

The potential sources of fecal coliform include run-off from livestock grazing, manure applications, industrial processes, residential, and domestic pets waste. Some of these sources are driven by dry weather and others are driven by wet weather. The potential sources of fecal coliform in the watershed were identified and characterized. These

5.3.1.3. Roanoke River Waste Load Allocation

There are 6 industrial and municipal permitted facilities in the Roanoke River watershed permitted to discharge bacteria (see Chapter 4). For this TMDL, the wasteload allocation for permitted facilities is to maintain discharge at the design flow limits and bacteria concentrations at their permitted levels of 126 cfu/100mL. Table 5-3 shows the loading from the industrial and municipal permitted facilities in the watershed.

Table 5-3: Roanoke River Wasteload Allocation for E. coli

Point Source	Name	Existing Load (cfu/yr)	Allocated Load (cfu/yr)	Percent Reduction
VA0077895	Roanoke Moose Lodge	8.18E+09	8.18E+09	0%
VA0027481	Blacksburg Country Club Sewage Treatment Plant	6.10E+10	6.10E+10	0%
VA0062219	Montgomery County PSA – Elliston-Lafayette WWTP	4.34E+11	4.34E+11	0%
VA0024031	Shawsville Town – Sewage Treatment Plant	3.48E+11	3.48E+11	0%
VA0025020	Western Virginia Water Authority WPC	1.08E+14	1.08E+14	0%
VA0028711	Suncrest Heights	3.48E+10	3.48E+10	0%
Total		**1.09E+14**	**1.09E+14**	**0%**

Within Wilson Creek there are seven MS4s permits requiring TMDL allocations. Table 5-4 shows the waste load allocations for each MS4. The waste load allocations were based on each municipality's share of the contributing urbanized area of the impairment. Appendix F outlines the steps used in the development of the MS4 E-coli allocations.

Table 5-4: Roanoke River MS4s Wasteload Allocation for E. coli

MS4 Permit Holder	Permit Number	Existing Load (cfu/yr)	Allocated Load (cfu/yr)	Percent Reduction
Roanoke County	VAR040022	2.37E+13	2.84E+11	98.8%
City of Roanoke	VAR040004	1.61E+13	1.93E+11	98.8%
Town of Vinton	VAR040026	2.77E+12	3.32E+10	98.8%
City of Salem	VAR040010	1.91E+13	2.29E+11	98.8%
VDOT Roanoke Urban Area	VAR040017	8.94E+11	1.07E+10	98.8%
Virginia Western Community College	VAR040030	1.44E+11	1.73E+09	98.8%
Virginia Medical Center	VAR040050	6.56E+11	7.87E+09	98.8%
	Total	**6.34E+13**	7.60E+11	**98.8%**

coliform to E. coli; therefore, modeled fecal coliform concentrations were changed to E. coli concentrations using a translator. Water quality standards for both fecal coliform and E. coli were exceeded for the most part during this time period.

TMDL Calculations

The TMDL represents the maximum amount of a pollutant that the stream can receive without exceeding the water quality standard. The load allocation for the selected scenarios was calculated using the following equation:

$$TMDL = \sum WLA + \sum LA + MOS$$

Where,

WLA = wasteload allocation (point source contributions);

LA = load allocation (non-point source allocation); and

MOS = margin of safety.

The margin of safety (MOS) is a required component of the TMDL to account for any lack of knowledge concerning the relationship between effluent limitations and water quality. The MOS was implicitly incorporated in this TMDL. Implicitly incorporating the MOS required that allocation scenarios be designed to meet a 30-day geometric mean E. coli standard of 126 cfu/100 ml and the instantaneous E. coli standard of 235 cfu/100 ml with 0% exceedance.

Typically, there are several potential allocation strategies that would achieve the TMDL endpoint and water quality standards. A number of load allocation scenarios were developed to determine the final TMDL load allocation scenario.

For the hydrologic period from January 1995 to December 2004, fecal coliform loading and instream fecal coliform concentrations were estimated for the various scenarios using the developed HSPF model of the Wilson Creek, Ore Branch, and Roanoke River watersheds. Because Virginia has recently changed its bacteria standard from fecal coliform to E. coli, modeled fecal coliform concentrations were translated to E. coli concentrations, and the TMDL allocation plan was developed to meet geometric mean

Table E-5: Roanoke River Wasteload Allocation for E. coli

Point Source	Name	Existing Load (cfu/yr)	Allocated Load (cfu/yr)	Percent Reduction
VA0077895	Roanoke Moose Lodge	8.18E+09	8.18E+09	0%
VA0027481	Blacksburg Country Club Sewage Treatment Plant	6.10E+10	6.10E+10	0%
VA0062219	Montgomery County PSA – Elliston-Lafayette WWTP	4.34E+11	4.34E+11	0%
VA0024031	Shawsville Town – Sewage Treatment Plant	3.48E+11	3.48E+11	0%
VA0025020	Western Virginia Water Authority Water Pollution Control Plant	1.08E+14	1.08E+14	0%
VA0028711	Suncrest Heights	3.48E+10	3.48E+10	0%
VAR040022*	Roanoke County	2.37E+13	2.84E+11	98.8%
VAR040004*	City of Roanoke	1.61E+13	1.93E+11	98.8%
VAR040026*	Town of Vinton	2.77E+12	3.32E+10	98.8%
VAR040010*	City of Salem	1.91E+13	2.29E+11	98.8%
VAR040017*	VDOT Roanoke Urban Area	8.94E+11	1.07E+10	98.8%
VAR040030*	Virginia Western Community College	1.44E+11	1.73E+09	98.8%
VAR040050*	Virginia Medical Center	6.56E+11	7.87E+09	98.8%
	Total	**1.72E+14**	**1.10E+14**	**36.0%**

(*) MS4 permit loads based on each share of the MS4 contributing urbanized area of the impairment. Appendix F outlines the steps used in the development of the MS4 E. coli allocations.

In addition to the impaired segments on Wilson Creek and Ore Branch, this report also addresses two impairments on the Roanoke River. The first impaired segment (VAW-L04R-01) begins at the confluence of Mason Creek with the Roanoke River at river mile 210.47 and ends at the outfall of the Roanoke Regional STP at river mile 200.60. This impairment is based on two listing stations: 4AROA212.17 and 4AROA202.20. Eight of 41 samples (20%) collected at 4AROA212.17 and 17 of 58 samples (29%) collected at 4AROA202.20 between January 1, 1998 and December 31, 2002 exceeded the fecal coliform bacteria instantaneous criterion of 400 cfu/100 ml. The second impaired segment (VAW-L04R-02) begins at the Roanoke Regional STP outfall and ends at the Niagara Dam at river mile 198.36.

The total length of these four segments is 23.09 miles. Table 1-1 summarizes the details of the Wilson Creek, Ore Branch and Roanoke River impaired segments and Figure 1-2 presents their location.

Table 1-1: Details of the Wilson Creek, Ore Branch and Roanoke River Bacteria Impairments

Segment ID	Segment Name	Upstream Boundary	Downstream Boundary	Length (Miles)	Years Listed
VAW-L02R-02	Wilson Creek (and UT to Wilson Cr.)	East of Rt. 460, off Rt. 723, Christiansburg	Wilson Cr. Mouth on N.F. Roanoke R.	6.91 (1.65)	1996, 1998, 2002, 2004
VAW-L04R-04	Ore Branch	Headwaters in Hunting Hills	Ore Br. Mouth on Roanoke R.	2.42	1996, 1998, 2002, 2004
VAW-L04R-01*	Roanoke River	Confluence of Mason Cr. on the Roanoke R.	Roanoke Regional STP Outfall on the Roanoke R.	9.87	1996, 1998, 2002, 2004
VAW-L04R-02*	Roanoke River	Roanoke Regional STP Outfall on the Roanoke R.	Niagara Dam	2.24	1996, 1998, 2002, 2004
VAW-L12L-04* (in L07)	Smith Mountain Lake – Roanoke River	Back Cr. Mouth on Roanoke R. (795 ft. pool elevation)	Falling Cr. Mouth on Roanoke R. SML	6.26 (378 acres)	1998, 2002, 2004

* Portions of these segments also do not support the Aquatic Life and Fish Consumption Uses; TMDLs for these impairments are being developed separately.
Source: Virginia 2004 Water Quality Assessment 305(b)/303(d) Integrated Report.

5.0 Allocation

For the Wilson Creek, Roanoke River and Ore Branch bacteria TMDLs, allocation analysis was the third stage in development. Its purpose was to develop the framework for reducing bacteria loading under the existing watershed conditions so water quality standards can be met. The TMDL represents the maximum amount of pollutant that the stream can receive without exceeding the water quality standard. The load allocations for the selected scenarios were calculated using the following equation:

$$TMDL = \sum WLA + \sum LA + MOS$$

Where,

WLA = wasteload allocation (point source contributions);

LA = load allocation (non-point source allocation); and

MOS = margin of safety.

Typically, there are several potential allocation strategies that would achieve the TMDL endpoint and water quality standards. Available control options depend on the number, location, and character of pollutant sources.

5.1 Incorporation of Margin of Safety

The margin of safety (MOS) is a required component of the TMDL to account for any lack of knowledge concerning the relationship between effluent limitations and water quality. According to EPA guidance (*Guidance for Water Quality-Based Decisions: The TMDL Process, 1991*), the MOS can be incorporated into the TMDL using two methods:

- Implicitly incorporating the MOS using conservative model assumptions to develop allocations; or
- Explicitly specifying a portion of the TMDL as the MOS and using the remainder for allocations.

The MOS will be implicitly incorporated into this TMDL. Implicitly incorporating the MOS will require that allocation scenarios be designed to meet the monthly fecal coliform geometric mean standard of 200 cfu/100 ml and the instantaneous fecal coliform standard of 400 cfu/100 ml with 0% exceedance. In terms of E. coli, incorporating an

implicit MOS will require that the allocation scenario be designed to meet the monthly geometric mean standard of 126 cfu/100 ml and the instantaneous standard of 235 cfu/100 ml with 0 violations.

5.2 Sensitivity Analysis

The sensitivity analysis of the fecal coliform loadings and the waterbody response provides a better understanding of the watershed conditions that lead to the water quality standard violations, and provides insight and direction in developing the TMDL allocations and implementation. Based on the sensitivity analysis, several allocation scenarios were developed. For each scenario developed, the percent of days water quality conditions violate the monthly geometric mean standard and instantaneous standard for E. coli were calculated. The results of the sensitivity analysis are presented in Appendix E.

5.3 Allocation Scenario Development

Allocation scenarios were modeled using the calibrated HSPF model to adjust the existing conditions until the water quality standard was attained. The TMDLs developed for the Wilson Creek, Roanoke River, and Ore Branch watershed were based on the Virginia State Standard for *E. coli*. As detailed in Section 1.2, the *E. coli* standard states that the calendar month geometric-mean concentration shall not exceed 126 cfu/100 ml, and that a maximum single sample concentration of *E.coli* not exceed 235 cfu/100 ml. According to the guidelines put forth by the DEQ (DEQ, 2003) for modeling *E. coli* with HSPF, the model was set up to estimate loads of fecal coliform, and then the model output was converted to concentrations of *E. coli* with the following equation:

$$\log_2 (C_{ec}) = -0.0172+0.91905*\log2(c_{fc})$$

Where C_{ec} is the concentration of E. coli in cfu/100 ml, and C_{fc} is the concentration of fecal coliform in cfu/100 ml.

The pollutant concentrations were simulated over the entire duration of a representative modeling period, and pollutant loads were adjusted until the standard was met. The development of the allocation scenarios was an iterative process requiring numerous runs where each run was followed by an assessment of source reduction against the water

5.3.1.3. Roanoke River Waste Load Allocation

There are 6 industrial and municipal permitted facilities in the Roanoke River watershed permitted to discharge bacteria (see Chapter 4). For this TMDL, the wasteload allocation for permitted facilities is to maintain discharge at the design flow limits and bacteria concentrations at their permitted levels of 126 cfu/100mL. Table 5-3 shows the loading from the industrial and municipal permitted facilities in the watershed.

Table 5-3: Roanoke River Wasteload Allocation for E. coli

Point Source	Name	Existing Load (cfu/yr)	Allocated Load (cfu/yr)	Percent Reduction
VA0077895	Roanoke Moose Lodge	8.18E+09	8.18E+09	0%
VA0027481	Blacksburg Country Club Sewage Treatment Plant	6.10E+10	6.10E+10	0%
VA0062219	Montgomery County PSA – Elliston-Lafayette WWTP	4.34E+11	4.34E+11	0%
VA0024031	Shawsville Town – Sewage Treatment Plant	3.48E+11	3.48E+11	0%
VA0025020	Western Virginia Water Authority WPC	1.08E+14	1.08E+14	0%
VA0028711	Suncrest Heights	3.48E+10	3.48E+10	0%
Total		**1.09E+14**	**1.09E+14**	**0%**

Within Wilson Creek there are seven MS4s permits requiring TMDL allocations. Table 5-4 shows the waste load allocations for each MS4. The waste load allocations were based on each municipality's share of the contributing urbanized area of the impairment. Appendix F outlines the steps used in the development of the MS4 E-coli allocations.

Table 5-4: Roanoke River MS4s Wasteload Allocation for E. coli

MS4 Permit Holder	Permit Number	Existing Load (cfu/yr)	Allocated Load (cfu/yr)	Percent Reduction
Roanoke County	VAR040022	2.37E+13	2.84E+11	98.8%
City of Roanoke	VAR040004	1.61E+13	1.93E+11	98.8%
Town of Vinton	VAR040026	2.77E+12	3.32E+10	98.8%
City of Salem	VAR040010	1.91E+13	2.29E+11	98.8%
VDOT Roanoke Urban Area	VAR040017	8.94E+11	1.07E+10	98.8%
Virginia Western Community College	VAR040030	1.44E+11	1.73E+09	98.8%
Virginia Medical Center	VAR040050	6.56E+11	7.87E+09	98.8%
	Total	**6.34E+13**	7.60E+11	**98.8%**

CO Advice email entitled: Draft TMDL Approach for Individual VPDES Permits:

From: Cunningham,Frederick
Sent: Wednesday, October 22, 2008 3:30 PM
To: Tuxford,Burton; Brockenbrough,Allan; Daub,Elleanore; Thompson,Alison; Thomas,Bryant; Foster,Kip; Fowler,Keith; Linderman,Curtis; McConathy,James; Newman,Allen
Cc: Martin,Charles; Lott,Craig
Subject: Draft TMDL Approach for Individual VPDES Permits

Good afternoon,

Over the next few months the CO TMDL and Permit sections plan to develop guidance to address the inclusions of TMDLs into individual VPDES permits. Until this TMDL guidance is finalized we are proposing the following approach for issuance of individual permits. Please review prior to our Permit Managers meeting on the 27th so we can discuss. Thanks.

Fred

TSS TMDL - tons/yr or lb/yr

TSS TMDL Permit Limits - municipal facilities

Include kg/d limits expressed as a monthly and weekly limit based on the TMDL. Concentration limits for the permit are the secondary federal effluent guideline (30 mg/l, 45mg/l) unless BPJ or other regulations (e.g. Potomac Embayment) require more stringent concentration limits.

TSS TMDL Permit Limits - industrial facilities

Handle on cases by case basis since there have been few of these thus far.

Metals TMDL - kg/yr

Metal TMDL Permit Limits - municipal and industrial facilities

Include kg/year limit based upon the TMDL. Concentration limits should be based upon existing permit water quality criteria concentrations. Add a special condition to explain how to calculate calendar year limit.

Bacteria TMDL - cfu/yr

Newer TMDLs have a 'growth factor' included for increased flows usually 2 - 5X the flow so any permits that get reissued use 126 cfu/100ml - no reductions in concentration are necessary for flow tiers because the TMDL considered growth. No limit per calendar year.

Older TMDLs are based upon existing flow so growth or flow tiers are not considered. The loads are cfu/year and usually based on 200 or 126 E.coli. Region may lower the bacteria concentrations limits to meet the original TMDL load as the facility flows increase or may revise the

TMDL (in house) to include a 'growth factor' and issue permit with 126 cfu/ml limit. In either case no limit per calendar year.

Fred K. Cunningham, Director

Office of Water Permits & Compliance Assistance

Virginia Department of Environmental Quality

phone: 804.698.4285

fax: 804.698.4032

Attachment H

Endangered Species Information

L. Preston Bryant, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951 FAX (804) 371-2674

September 23, 2008

Becky France
DEQ-WCRO
3019 Peters Creek Road
Roanoke, VA 24019

Re: #0025020 WVWA WPCP

Dear Ms. France:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Roanoke River-North and South Forks Stream Conservation Unit is downstream of the project area. Stream Conservation Units (SCUs) identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. Stream Conservation Units are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. Brank is a rating of the significance of the site based on presence and number of natural heritage resources; on a scale of 1-5, 1 being most significant. This site has been ranked as a B2 conservation site, which indicates it is of very high significance. The natural heritage resources associated with this site of concern are as follows:

Noturus gilberti	Orangefin madtom	G2/S2/SOC/LT
Percina rex	Roanoke logperch	G1G2/S1S2/LE/LE

The Orangefin madtom, native to the upper Roanoke drainage in Virginia and North Carolina, inhabits moderate to strong riffles and runs having little or no silt in moderate-gradient, intermontane and upper Piedmont streams. This species is an intersticine dweller, found in or near cavities formed by rubble and boulders (Jenkins and Burkhead, 1993). Please note that this species is currently classified as threatened by the Virginia Department of Game and Inland Fisheries (VDGIF) and as a species of concern by the United States Fish and Wildlife Service (USFWS).

The Roanoke logperch is endemic to the Roanoke and Chowan River drainages in Virginia (Burkhead and Jenkins, 1991) and inhabits medium and large, warm and usually clear rivers with sandy to boulder spotted bottoms (TNC et. al., 1991). The Roanoke logperch is threatened by channelization, siltation, impoundment, pollution, and de-watering activities (Burkhead & Jenkins, 1991). Please note that this species is currently classified as endangered by the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Game and Inland Fisheries (VDGIF).

In addition, according to the information currently in our files, the Roanoke River has been designated by the Virginia Department of Game and Inland Fisheries (VDGIF) as a "Threatened and Endangered Species Water". The species listed above are also associated with this T & E Water.

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations. Due to the legal status of these natural heritage resources, DCR also recommends coordination with the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Game and Inland Fisheries (VDGIF) to ensure compliance with protected species legislation.

This project has also been sent to the Virginia Karst Program and to the Virginia Speleological Survey for review for documented sensitive karst features and caves. The portion of the project site that is located west of the City of Roanoke boundary within Roanoke County is underlain by carbonate bedrock. If karst features such as sinkholes, caves, disappearing streams, and large springs are encountered during the project, please coordinate with Wil Orndorff (540-394-2552, Wil.Orndorff@dcr.virginia.gov) to document and minimize adverse impacts. Discharge of runoff to sinkholes or sinking streams, filling of sinkholes, and alteration of cave entrances can lead to surface collapse, flooding, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources. If the project involves filling or "improvement" of sinkholes or cave openings, DCR would like detailed location information and copies of the design specifications. In cases where sinkhole improvement is for stormwater discharge, copies of VDOT Form EQ-120 will suffice.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

Our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters, that may contain information not documented in this letter. Their database may be accessed from www.dgif.virginia.gov/wildlife/info map/index.html, or contact Shirl Dressler at (804) 367-6913.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

S. Rene' Hypes
Project Review Coordinator

CC: Wil Orndorff, DCR-Karst
Ernie Aschenbach, VDGIF
Tylan Dean, USFWS

Literature Cited

Burkhead, N.M. and R.E. Jenkins. 1991. Roanoke logperch. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. p. 395-397.

Jenkins, R. E., and N. M. Burkhead. 1993. Freshwater fishes of Virginia. American Fisheries Society, Bethesda, Maryland.

The Nature Conservancy and The Network of Natural Heritage Programs and Conservation Data Centers. 1991. Natural Heritage Conservation Databases. Accessed through the Biosource web site project. The Nature Conservancy, Arlington, VA. (7/14/99).

Virginia Fish and Wildlife Information Service

Define Point of Interest

37,16,00.3 -79,54,39.2
is the Search Point
Submit Cancel

Search Point
- Change to "clicked" map point
- Fixed at 37,16,00.3 - 79,54,39.2

Show Position Rings
Yes No
1/4 mile and 1/16 mile at the Search Point

Show Search Area
Yes No
2 miles

Search Point is at map center

Base Map Choices
Topography

Map Overlay Choices
Current List: Position, Search

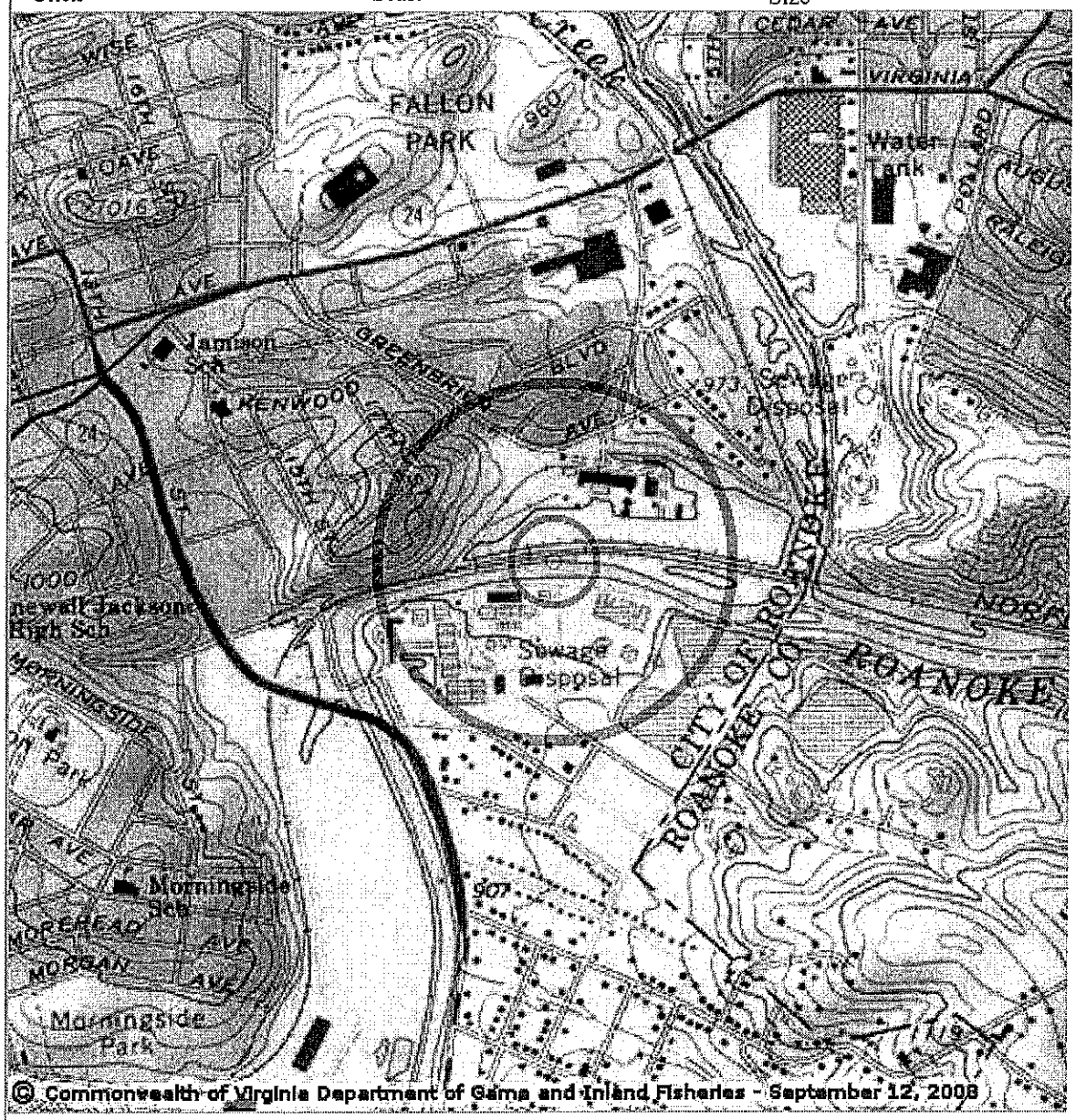
Map Overlay Legend

Position Rings 1 4 mile and 1 16 mile at the Search Point

2 mile radius Search Area

back | Refresh Browser Page

Map Click: Pan | Map Scale: In Zoom Out | Screen Size: Small Size



France,Becky

From: Aschenbach, Ernie (DGIF)
Sent: Wednesday, October 15, 2008 5:18 PM
To: France,Becky; Daub,Elleanore; Cindy_Kane@fws.gov
Cc: Pinder, Mike (DGIF); Aschenbach, Ernie (DGIF)
Subject: FW: ESSLog# 25751_VPDES Permit VA0025020_ WVWA WPCP

Becky France
DEQ-WCRO
3019 Peters Creek Rd
Phone: (540) 562-6793
Email: blfrance@deq.virginia.gov

We have reviewed the application number VA0025020 for the re-issuance of the Virginia Pollution Discharge Elimination System (VPDES) permit for the WVWA Water Pollution Control Plant (WPCP) on the Roanoke River in Roanoke, Virginia.

According to our records, the state Threatened (ST) loggerhead shrike is known from the project area, Based on the project scope and outfall location, we do not anticipate this permit renewal to result in adverse impact to this species.

The federal Endangered state Endangered (FESE) Roanoke logperch and federal Species of Concern state Threatened orangefin madtom area known from the project area. The Roanoke River is a designated Federal/State Threatened and Endangered (T&E) Species water due to the presence of these species. In order to protect the overall health of the aquatic resources, including listed species, we recommend that effluent from this facility be treated with ultraviolet light disinfection, rather than chlorine. We recommend coordination with the USFWS regarding federally listed species in the area.

Thank you.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230
Phone: (804) 367-2733
FAX: (804) 367-2427
Email: Ernie.Aschenbach@dgif.virginia.gov

Printer Friendly

VaFWIS Search Report Compiled on 9/12/2008, 9:41:45 AM

Known or likely to occur within a **2 mile radius of null**
(at 37,16,00. -79,54,39.)
in **770 Roanoke City, 161 Roanoke County, VA**

69 Known or Likely Species ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirr
010214	FESE	I	Logperch, Roanoke	Percina rex	Yes
010127	FSST	II	Madtom, orangefin	Noturus gilberti	Yes
010110	FS	III	Jumprock, bigeye	Moxostoma ariommum	Yes
010174	SS	II	Bass, Roanoke	Ambloplites cavifrons	
010115	SS	III	Sucker, rustyside	Thoburnia hamiltoni	
060145		III	Mussel, notched rainbow	Villosa constricta	
010200		IV	Darter, riverweed	Etheostoma podostemone	Yes
010131		IV	Eel, American	Anguilla rostrata	
010109		IV	Sucker, Roanoke hog	Hypentelium roanokense	Yes
060137		IV	Mussel, creeper	Strophitus undulatus	
010188			Bass, largemouth	Micropterus salmoides	Yes
010175			Bass, rock	Ambloplites rupestris	Yes
010186			Bass, smallmouth	Micropterus dolomieu	Yes
010183			Bluegill	Lepomis macrochirus	Yes
010034			Bowfin	Amia calva	
010123			Bullhead, brown	Ameiurus nebulosus	Yes
010122			Bullhead, yellow	Ameiurus natalis	Yes
010062			Carp, common	Cyprinus carpio	Yes
010125			Catfish, channel	Ictalurus punctatus	
010120			Catfish, white	Ameiurus catus	Yes
010066			Chub, bluehead	Nocomis leptocephalus	Yes
010373			Chub, bull	Nocomis raneyi	Yes
010103			Chub, creek	Semotilus atromaculatus	Yes
010067			Chub, river	Nocomis micropogon	Yes
010190			Crappie, black	Pomoxis nigromaculatus	Yes
010101			Dace, blacknose	Rhinichthys atratulus	Yes
010102			Dace, longnose	Rhinichthys cataractae	Yes
010060			Dace, mountain redbelly	Phoxinus oreas	Yes
010366			Dace, rosyside	Clinostomus funduloides	Yes

010193			Darter, fantail	Etheostoma flabellare	Yes
010198			Darter, johnny	Etheostoma nigrum	Yes
010196			Darter, longfin	Etheostoma longimanum	
010061			Darter, Roanoke	Percina roanoka	Yes
010213			Darter, shield	Percina peltata	Yes
010104			Fallfish	Semotilus corporalis	
010112			Jumprock, black	Moxostoma cervinum	Yes
010129			Madtom, margined	Noturus insignis	Yes
010099			Minnow, bluntnose	Pimephales notatus	Yes
010063			Minnow, cutlips	Exoglossum maxillingua	Yes
010100			Minnow, fathead	Pimephales promelas	
010056			Pickerel, chain	Esox niger	
010182			Pumpkinseed	Lepomis gibbosus	Yes
010374			Quillback	Carpiodes cyprinus	
010114			Redhorse, golden	Moxostoma erythrurum	Yes
010116			Redhorse, shorthead	Moxostoma macrolepidotum	Yes
010387			Redhorse, silver	Moxostoma anisurum	Yes
010113			Redhorse, v-lip	Moxostoma pappillosum	
010283			Sculpin, mottled	Cottus bairdi	
010041			Shad, gizzard	Dorosoma cepedianum	
010080			Shiner, common	Luxilus cornutus	
010078			Shiner, crescent	Luxilus cerasinus	Yes
010068			Shiner, golden	Notemigonus crysoleucas	Yes
010087			Shiner, highland (= southern rosyface; = redface)	Notropis micropteryx	
010094			Shiner, mimic	Notropis volucellus	Yes
010074			Shiner, rosefin	Lythrurus ardens	Yes
010073			Shiner, satinfin	Cyprinella analostana	Yes
010082			Shiner, spottail	Notropis hudsonius	Yes
010086			Shiner, swallowtail	Notropis procne	Yes
010069			Shiner, white	Luxilus albeolus	Yes
010058			Stoneroller, central	Campostoma anomalum	Yes
010108			Sucker, northern hog	Hypentelium nigricans	Yes
010118			Sucker, torrent	Moxostoma rhothoecum	Yes
010105			Sucker, white	Catostomus commersoni	Yes
010181			Sunfish, green	Lepomis cyanellus	Yes
010180			Sunfish, redbreast	Lepomis auritus	Yes

010052			Trout, brook	Salvelinus fontinalis	Yes
010051			Trout, brown	Salmo trutta	Yes
010050			Trout, rainbow	Oncorhynchus mykiss	Yes
060025			Mussel, eastern elliptio	Elliptio complanata	

* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candid Candidate; CC=Collection Concern; SS=State Special Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

- | DGIF| Credits | Disclaimer | Contact shirl.dressler@dgif.virginia.gov |Please view our privacy policy |

- Site tested using browsers Firefox 2.0, Firefox 3.0, IE 6, IE 7, and Opera 9.2 DEQ5 I 201154 undefined
- W3C HTML validation <BASE href="http://www.vafwis.org/fwis/NewPages/">VaFWIS_report_search.asp